



From Data Centers to Cloud Native

Spotify's Infrastructure Transition

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Our Journey



Data Centers

Our Journey



Cloud Hosted

Our Journey



Cloud Native




Data Centers

A dark server room with rows of server racks and glowing lights. The racks are filled with server components, and the floor is dark. The text "Custom Container Orchestration (Helios)" is overlaid in the center.

Custom Container Orchestration (Helios)



Custom Monitoring Platform (Alien / Heroic)

A photograph of a server rack in a data center. The rack is filled with network equipment. In the foreground, several yellow Ethernet cables are plugged into a patch panel. The background shows a server unit with various indicator lights and labels. The text "Proprietary Messaging Framework (hermes)" is overlaid in white on the center of the image.

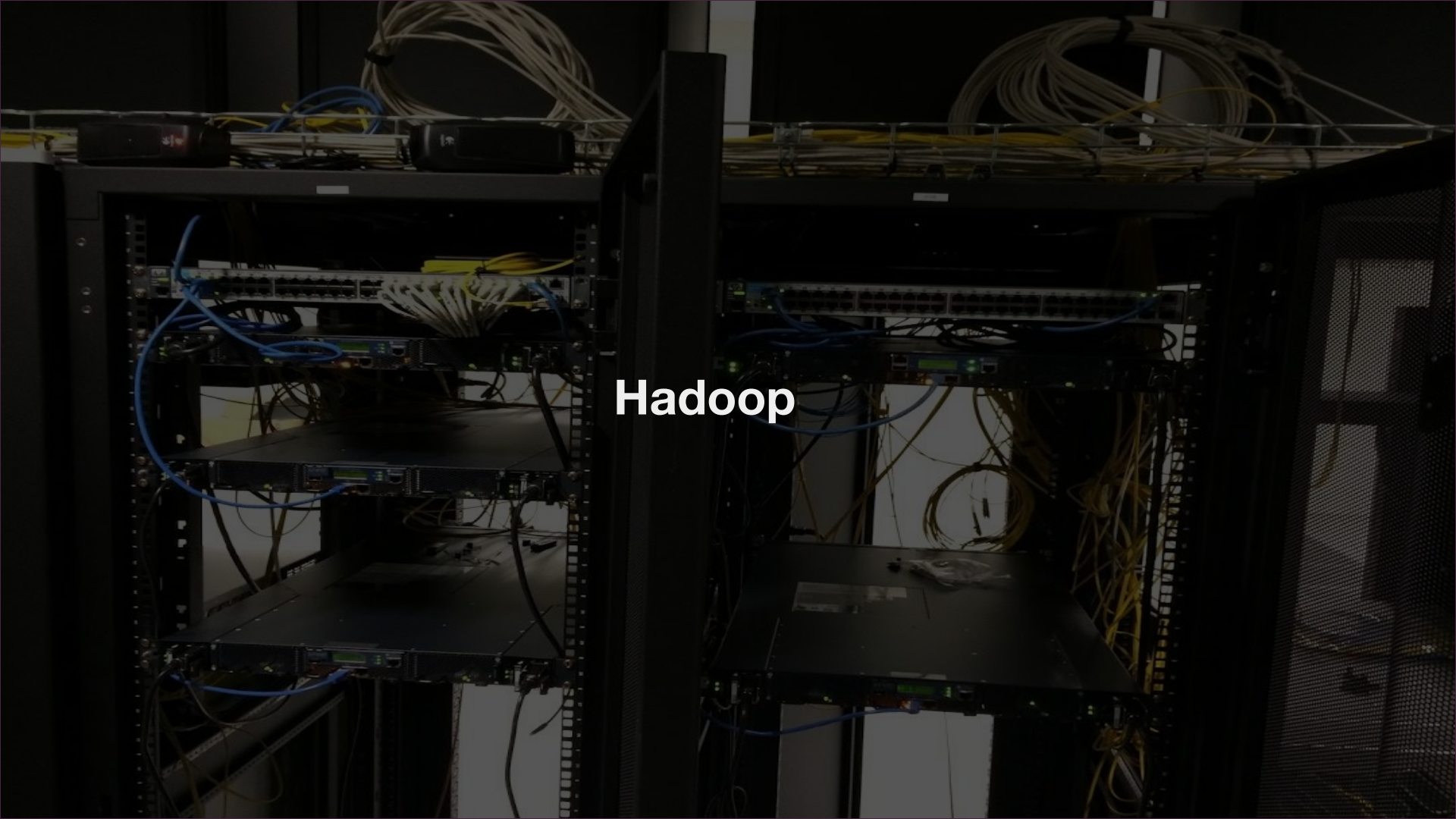
Proprietary Messaging Framework (hermes)



Custom Service Framework (Apollo)



SQL and Cassandra based storage

A photograph of a server rack in a data center. The rack is filled with server hardware, including network switches and server units. Numerous cables, primarily blue and yellow, are plugged into the front panels and bundled together at the top. The word "Hadoop" is overlaid in white, bold, sans-serif font in the center of the image. The lighting is dim, highlighting the metallic surfaces and the organized chaos of the server environment.

Hadoop




Golden Path

A large, faint question mark shape is formed by clouds in a blue sky. The question mark is composed of several distinct cloud formations: a large, rounded top section, a smaller, rounded middle section, and a small, rounded bottom section. The background is a solid blue color with some lighter blue areas where the clouds are more prominent.

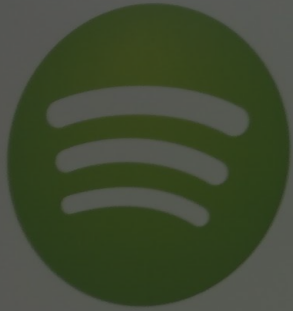
Cloud Hosted



**Moving Services To
Cloud**

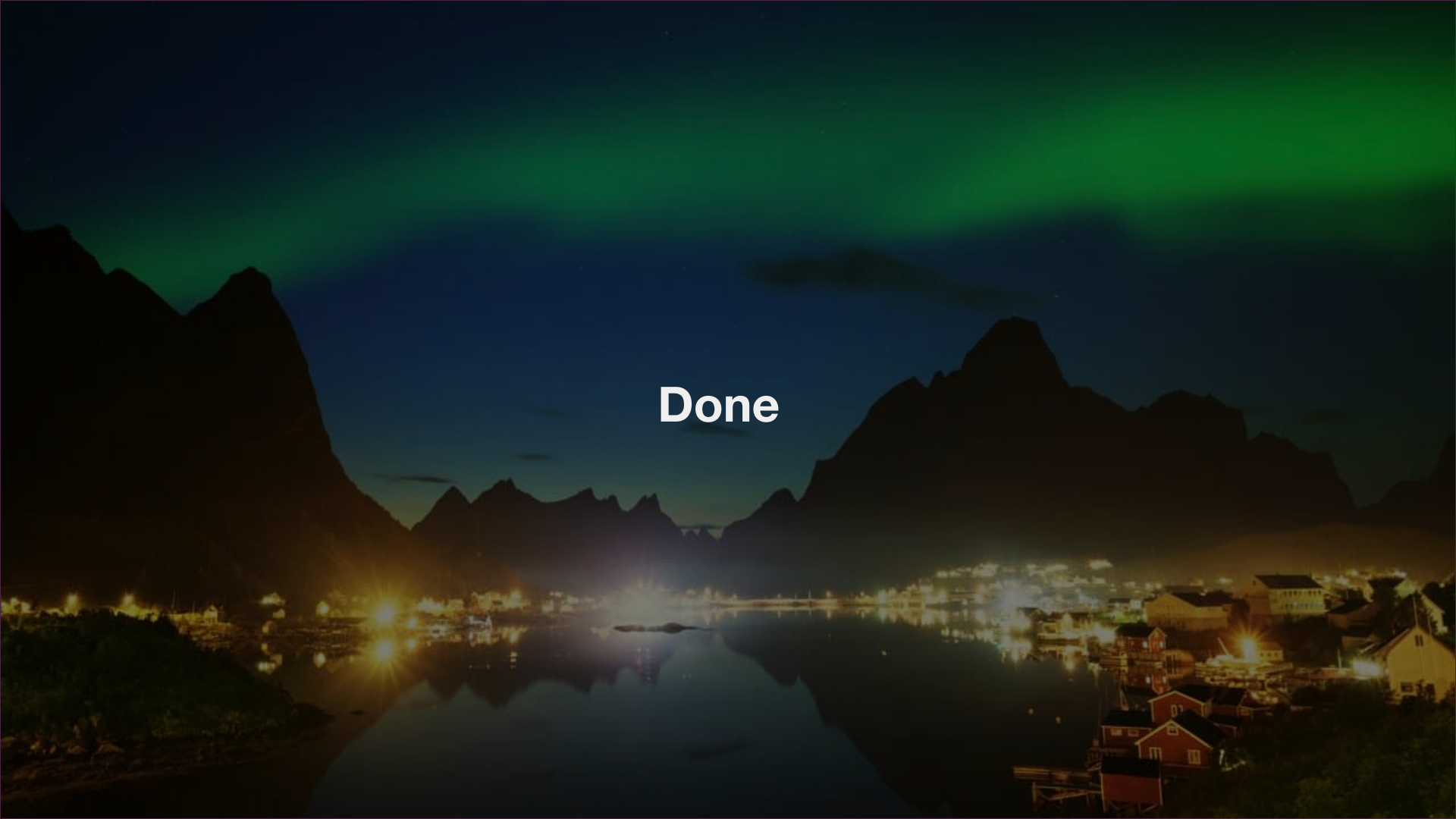


Moving Data Jobs To Cloud



Spotify®

Moving Out

A night landscape photograph of a coastal town, likely Lofoten in Norway, with mountains and aurora borealis. The town's lights are reflected in the water, and the aurora borealis is visible in the dark sky. The word "Done" is overlaid in the center.

Done

The image features a dark blue background with a repeating pattern of white question marks and clouds. The question marks are scattered across the frame, and the clouds are positioned at the bottom, creating a sense of depth and atmosphere. The overall composition is clean and modern, with a focus on the central text.

Cloud Native?



Kubernetes: How We're Migrating

kubernetes



**Experiment: One Service
on Cluster**

kubernetes

Experiment: One Service on Cluster

- Integration with existing metrics system
- Logging
- Integration with existing service discovery
- DNS Setup
- Networking + Routability Setup
- Cluster Creation

kubernetes



**Experiment: Three
Services on shared
Cluster**

kubernetes

Experiment: Three Services on shared Cluster

- **Permissioning by namespace**
- **Quotas by namespace**
- **Developer Documentation**



kubernetes



**Alpha Phase: Run
Volunteer Services on
shared Clusters**

kubernetes

Alpha: Run Volunteered Services on shared Clusters

- **Scripted Cluster creation**
- **Test Clusters**
- **Integration with existing secrets system**
- **Initial deployment tooling and CI Integration**
- **Lots of varied learnings from varied services**



kubernetes



**Experiment: Two
High-Traffic Services on
shared Clusters**

kubernetes

Experiment: Two High-Traffic Services on shared Clusters

- Use/experimentation with autoscaling
- Really understand network setup
- Provide confidence/reference example

The Kubernetes logo, which is a blue octagon containing a white ship's wheel, is centered in the background of the slide.

kubernetes



**Beta Phase: Self-Service
Migration**

kubernetes

Beta Phase: Self-Service Migration

- Ops (reliability, oncall, alerts, disaster recovery, backups)
- Self-service of permissioning/quotas
- Sustainable Deployment (Spinnaker)
- Decision on manifests storage/VCS
- Migration Tooling
- Seamless CI/CD Integration

kubernetes



GA Phase: “Golden Path”

kubernetes

GA Phase: “Golden Path”

- **Vertical Autoscaling (Right Sizing)**
- **Node Horizontal Autoscaling**
- **Distributed Tracing**
- **Migration Tooling**
- **Everything Else**
- **Migration Tracking**

kubernetes

Migration Takeaways

- **Migrate in stages/series of goals that increase in scope**
 - **Scope services to be migrated**
 - **No monolithic migration movement/effort**
 - **Discover unknowns/hidden problems at controllable pace**
 - **Aggressively throw on backlog/TODO list**
- **When in doubt, leverage timeboxed investigations to reduce risk**

kubernetes



Hermes

The image features a perspective view of a tunnel formed by multiple rows of binary digits (0s and 1s). The digits are arranged in a way that creates a strong sense of depth, receding towards a bright, circular light at the far end of the tunnel. The overall color palette is a dark, monochromatic blue. In the center of the tunnel, the word "Migration" is written in a clean, white, sans-serif font.

Migration

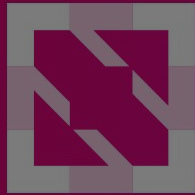


Schema Management



Istio

More?



**CLOUD NATIVE
COMPUTING FOUNDATION**



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